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PROGRESS REPORT
ON
AUTOMATIC PHOTOINTERPRETATION FOR PLANT SPECIES
AND STRESS IDENTIFICATION (ERTS-A1)

ERTS
Proposal Number MMC 647
Principal Investigator Number PR 202
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I. Progress

During this reporting period, we have formulated a plan for accomplishing the contract objectives. The basic characteristics of the satellite imagery which we intend to investigate are tone and texture. We will study tone in the various spectral bands and also look at texture using as many techniques as resources will allow. Among these are the Fast Walsh Transform, Fast Fourier Transform and Slant Transform.

The tonal study can be broken down into three tasks - data sampling, processing and normalization. In the course of analysis, minimum area samples will be determined. These are a function of information content as well as registration accuracy. Statistics and histograms will be computed of each of the spectral bands to see if wavelength alone is sufficient for classification.

An attempt will be made to calibrate or normalize the data based on total energy. An alternative would use clouds or water as a standard for detector calibration. By using a "standard", failure of any of the various channels can be detected.

The texture studies will also be performed on the various spectral bands. Performance will be determined as a function of pixels. An attempt will be made to obtain specie boundaries using tone, color and texture. Ground truth supplied by the University of Minnesota School of Forestry will be used to evaluate automatic classification performance.